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EXAMINER

JAGAN, MIRELLYS

ART UNIT PAPER NUMBER

2859

DATE MAILED: 09/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/814,487

Applicant(s)

RUFFA ET AL.

Examiner

Mirellys Jagan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 March 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

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DETAILED ACTION

Claim Objections

1. Claims 1-15 are objected to because of the following informalities:

In claim 1, there is lack of antecedent basis in the claim for the core having an “interior”, as stated in lines 7-8; there is lack of antecedent basis in the claim for the fibers scattering light, as stated in line 18 (“affect” should be changed to --scatter-- in line 16); and there is lack of antecedent basis in the specification for the invention having a plurality of layers of optical fibers (lines 11-12). In lines 15-17, it is not clear how there is temperature profile “data” in the fluid (“temperature profile data in” should be replaced with --a temperature profile of--). Also, it is not clear how a cable comprises a receiver means, a light source, and a processing means, i.e., the preamble of claim 1 claims a ‘cable’, but the body of the claim appears to claim an assembly or system using a cable.

Furthermore, the subject matter claimed in lines 4-6, 7-9, and 11-14 is not clearly stated, e.g., it is not clear how 1) the jacket defines and annular space between the jacket and core (lines 4-6) since the specification and figures disclose that there is no space between the core (14) and the jacket (18); 2) how the armor wires are located in the annular space (lines 7-8), since there is no annular space between the core and jacket; 3) the optical fibers are “around the core” (line 11) and interspersed “in said core” (line 13) since the annular space is outside the core between the core and the jacket; and 4) how the optical fibers are located in the annular space (lines 11-12), since there is no annular space between the core and jacket.

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Lastly, there is no structural relationship between the processing means and the receiver (e.g., the processing means analyzes the scattered light received by the receiver to provide a measurement of the temperature profile of the fluid).

In claim 2, there is lack of antecedent basis in the claim for “said processor”; and “data” should be deleted.

In claim 5, it is not clear how the wires are made of steel and KEVLARTM. The specification discloses that either the fiber is surrounded by an armor wire or steel tube, OR is surrounded by a bundle of steel armor wires encased by a KEVLARTM sleeve (see page 5, lines 9-13, and 15).

In claim 6, there is lack of antecedent basis in the disclosure for an optical fiber being enclosed in a steel tube AND being located in an armor wire (see claim 1). The disclosure states that either the fiber is surrounded by an armor wire or steel tube, OR is surrounded by a bundle of steel armor wires encased by a KEVLARTM sleeve.

In claim 7, there is lack of antecedent basis in the disclosure for an optical fiber being surrounded by a plurality (bundle) of steel armor wires AND being located in an armor wire (see claim 1). The disclosure states that either the fiber is surrounded by an armor wire (18) or steel tube, OR is surrounded by a bundle of steel armor wires (23) encased by a KEVLARTM sleeve.

In claim 10, there is lack of antecedent basis in the claim for “stainless steel”.

In claims 12 and 13, there is lack of antecedent basis in the claims for an “outer layer” of armor wires, and it is not clear how the armor wires are in the outer layer since they have been replaced (are no longer in the outer layer).

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In claim 14, there is no structural relationship between the processing means (of claim 1) and the processing system (is the processing system the processing means, or is it used in addition to the processing means?)

Lastly, claims 1-15 have numerous typographical errors. Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, the subject matter claimed in lines 4-6, 7-9, and 11-14 is not clear, e.g., it is not clear how 1) the jacket defines and annular space between the jacket and core (lines 4-6) since the specification and figures disclose that there is no space between the core (14) and the jacket (18); 2) how the armor wires are located in the annular space (lines 7-8), since there is no annular space between the core and jacket; 3) the optical fibers are "around the core" (line 11) and interspersed "in said core" (line 13) since the annular space is outside the core between the core and the jacket; and 4) how the optical fibers are located in the annular space (lines 11-12), since there is no annular space between the core and jacket.

Claims 2-15 are rejected for being dependent on rejected base claim 1.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,198,662 to Yamaguchi et al [hereinafter Yamaguchi] in view of U.S. Patent 5,212,755 to Holmberg.

Yamaguchi discloses a system for measuring a temperature profile of a body of water using an optical fiber tow cable suspended into the body of water from a ship, and a measuring device for continuously measuring temperature at various points along the length of the cable. The cable (4) comprises a core (15) having optic fibers (14) therein and surrounded by steel armor wires (16). The measuring device used OTDR (see figures 5 and 6) and comprises a light source that transmits optical pulses of light into the fibers, a receiver that receives backscattered light (Raman scattering) from the fibers, processing means for analyzing the backscattered light to measure the temperatures of the water along the length of the cable and measure the temperature profile, and a display unit for generating a visual representation (figure 6) of the temperature profile data (see figures 1, 3, and 6; column 3, lines 34-68; and column 4, lines 1-12).

Yamaguchi does not disclose that the fiber optic tow cable comprises a core; a jacket concentric with the core and defining an annular space between the jacket and the core; a plurality of steel or KEVLARTM armor wires radially spaced outside the interior of the core in

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the space and defining a radially located layer circumferentially concentric and spaced from the interior of the core; a plurality of optic fibers around the core in the outermost layer in the space interspersed in the core in a plurality of armored wires in the radially located layer; the plurality of fibers being enclosed in a steel tube or surrounded by a plurality of steel armor wires having a smaller diameter than the armor wires; and a corresponding armor wire is replaced by a fiber in the steel armor wire having a smaller diameter than the armor wires.

Holmberg discloses a fiber optic tow cable comprising:

a core (22);

a jacket (32) concentric with the core and defining an annular space between the jacket and the core;

a plurality of armor wires (26) radially spaced outside the interior of the core in the space and defining a radially located layer circumferentially concentric and spaced from the interior of the core, wherein the wires can be steel (16) or KEVLARTM fibers (26); and

a plurality of optic fibers around the core in the outermost layer in the space interspersed in the core in a plurality of armored wires (28) in the radially located layer. The cable is an improvement over prior art cables that have the fiber in the core since the optic fiber is placed outside of the core which reduces strain on the fiber, thereby improving the optical characteristics of the fiber (see figure 2; column 1, lines 15-63; column 2, line 52-column 3, line 17). The fibers can be enclosed in steel tubes or be surrounded by a plurality of steel armor wires having a smaller diameter than the armor wires, and a corresponding armor wire is replaced by a fiber in the steel armor wire having a smaller diameter than the armor wires (see column 2, lines 14-42).

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Referring to claim 1, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the cable of Yamaguchi by replacing the tow cable with a tow cable as taught by Holmberg, in order to provide a cable having reduced strain on the fibers thereby obtaining improved temperature measurements. Furthermore, the fibers are placed in the "outer layer" since there is only one layer of armor wires.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following patents and publication disclose a fiber optic tow cable for obtaining temperature distribution measurements:

U.S. Patent 6,591,046 to Stottlemeyer
U.S. Patent Application Publication 2002/0085819 to Stottlemeyer et al
U.S. Patent 6,072,928 to Ruffa
U.S. Patent 6,205,276 to Anelli et al
U.S. Patent 6,147,931 to Seaman et al

The following patent discloses a fiber optic cable:

U.S. Patent 6,195,488 to Song

The following patents disclose an optic fiber for obtaining temperature distribution measurements based on Raman-scattered light:

U.S. Patent 5,217,306 to Wada
U.S. Patent 6,542,228 to Hartog
U.S. Patent 5,449,233 to Sai et al
U.S. Patent 3,938,385 to Horwath
Japanese Patent 06221932 to Matsuda
Japanese Patent 02135615 to Onishi et al
Japanese Patent 06148001 to Amano et al

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7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mirellys Jagan whose telephone number is 571-272-2247. The examiner can normally be reached on Monday-Friday from 9AM to 4PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego Gutierrez can be reached on 571-272-2245. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MJ
September 13, 2004



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